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Moving to a Safer Food Supply:

Role of Performance Standards and Microbial Testing in Meat and Poultry Safety—

An interview with
Michael R. Taylor and J. Glenn Morris, M.D.
with an introduction by
Secretary of Agriculture Dan Glickman

USDA recently issued new regulations that will require meat and poultry establishments to implement Hazard Analysis and Critical Control Points (HACCP) systems as a means of controlling their processes to prevent microbial contamination. In addition—to monitor how well the system works—both plants and USDA will be testing for bacteria in meat and poultry. FSIS is first establishing performance criteria and requiring routine testing by slaughter establishments for generic *E. coli* as a process control indicator for fecal contamination. Second, it is adopting pathogen reduction performance standards, which industry must meet, to reduce the nationwide exposure to one specific foodborne pathogen, *Salmonella*, which is the leading cause of foodborne illness.

The inspection changes were generated in part by an outbreak of foodborne illness three years ago in the Pacific Northwest. Hundreds of people became sick and four children died as a result of eating undercooked hamburger prepared by a fast food chain. The hamburger was contaminated with a dangerous—or “pathogenic”—bacteria, known as *E. coli* O157:H7.

In this interview, Acting Under Secretary for Food Safety and FSIS Administrator Michael R. Taylor explains the reasons behind the changes and how the new system will work, and Dr. J. Glenn Morris, Director of the FSIS Epidemiology and Emergency Response Program, discusses the public health impact of the new rules.



Dan Glickman

“The most important changes in 90 years in meat and poultry inspection are moving into action. As a result of final rules on Pathogen Reduction and HACCP just published by USDA, meat and poultry plants will soon be doing business in a dramatically different way.

We have a long, proud history of protecting the public from unwholesome and unsafe products, but we know that what was successful in the past is no longer adequate. There is a critical gap in our program with respect to the control of harmful bacteria on raw meat and poultry, and these changes will help us to reduce the risk of foodborne illness from meat and poultry products.

These new rules will build effective preventive measures for harmful bacteria into the industry’s production process and our regulatory system. For the first time, meat and poultry plants will be required to put a science-based system in place to help prevent bacteria from contaminating meat and poultry. In addition—to monitor how well plants are doing—both plants and USDA will be testing for bacteria in meat and poultry.

I am confident that these changes will mean a safer food supply for the American public.”

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— Dan Glickman
Secretary of Agriculture

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Michael R. Taylor —



How the New System Will Work

Q. Can you explain the difference between the standards and testing requirements for *E. coli* and *Salmonella*?

A. Each standard and testing requirement serves an important function. Both are aimed at reducing contamination with all harmful bacteria that cause foodborne illness, but they contribute to achieving that objective in different ways. Their value comes from the way they work together to verify the effectiveness of an overall system of preventive process control.

First, we are establishing performance criteria for generic *E. coli* in raw products and requiring slaughter plants to test raw products for the bacteria as a means of determining whether the plant's processes are under control. Generic *E. coli* is not a pathogen but an indicator organism for fecal contamination. Generic *E. coli* test results will help plants determine whether their system for preventing and removing fecal contamination is doing its job.

Q. And why is this so important?

A. Fecal contamination is the primary avenue by which meat and poultry become contaminated with harmful bacteria. Preventing and removing fecal contamination is the most

significant sanitation responsibility slaughter plants are required to meet because it is the single most likely source of harmful contamination. We currently have a "zero tolerance" for fecal contamination, but up to now, our inspectors have had no way of verifying that plants are meeting the standard except through visual examination. The testing requirement will provide us with a way of detecting *invisible* contamination.

Q. What happens to plants that get a positive result?

A. First, it's important to know that we are establishing "criteria," and not "standards" for generic *E. coli*—there is a difference. The criteria for generic *E. coli* are guidelines, not regulatory standards. We will not use the test results by themselves to take any regulatory action. But we will expect plants to apply the criteria in evaluating whether they need to make improvements in their slaughter process to more effectively prevent fecal contamination.

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to reduce harmful bacteria."*

—Michael R. Taylor

Q. If generic *E. coli* will address that most significant avenue for harmful bacteria, why are standards for *Salmonella* needed as well?

A. Testing for generic *E. coli* alone does not fully address the problem of harmful bacteria, such as *Salmonella*, because fecal contamination is not the only factor that contributes to the presence of pathogens. Other factors include the condition of the animals prior to slaughter. From a public health standpoint, our objective

is to reduce harmful bacteria, and we must have a means of directly testing for and verifying that the incidences of harmful pathogens are reduced at slaughter and in raw ground products.

Q. Why *Salmonella*?

- A.** *Salmonella* is a pathogenic organism that is present on virtually all classes of raw food products and is the leading cause of foodborne illness associated with meat and poultry. And measures taken to reduce *Salmonella* are expected to result in reductions in other pathogens as well.

Q. FSIS already has microbial standards for some meat and poultry products—why are the new standards so significant?

- A.** It's true that FSIS already has some microbial standards in place. For instance, ready-to-eat products such as luncheon meats and hot dogs must be free of two pathogens—*Listeria monocytogenes* and *Salmonella*. In addition, two years ago, we established a zero tolerance for *E. coli* O157:H7 in ground beef and began a testing program for the pathogen. But aside from the zero tolerance for *E. coli* O157:H7 in ground beef, FSIS has never had microbial targets for raw meat and poultry products. With this rule, that no longer is the case.

Q. How will positive *Salmonella* results be handled?

- A.** For *Salmonella*, we are establishing regulatory *standards* rather than *criteria*—we will require the plant to meet the standard consistently over time as a condition to maintaining inspection. The strategy for enforcement of the *Salmonella* standard will be to use a systems approach to ensure that the standard is applied in a fair, equitable and common-sense manner. If a plant fails to meet the standard, it must institute corrective actions to lower the incidence of *Salmonella* on the product or ultimately stop producing the product.

Q. So you won't use the test results to condemn individual lots of product?

- A.** No. We are not using test results to condemn product—we are using them to verify that the slaughter process and the process for producing raw ground product are under control with respect to *Salmonella*. It's an important distinction from a regulatory standpoint, but for consumers, the important point is that they will get products with reduced or no pathogen contamination.

Q. It seems rather obvious to most people that if raw meat and poultry has bacteria that is causing foodborne illness, the government should set standards to limit the bacteria. Why hasn't it been done before?

- A.** It may seem obvious, but it really is a difficult issue that has been debated by many food safety experts.

In the past, it has been very difficult to control pathogens on raw products. During the last several years, however, we have developed new technologies—such as antimicrobial rinses and steam pasteurization—that can be used in plants to help to reduce bacteria. And preventive controls to reduce pathogens—such as HACCP—are becoming widely used in the food industry. It is simply time to harness the available science and technology and do everything it is reasonably possible to do to reduce harmful bacteria.



“HACCP-based process control must be combined with food safety performance criteria and standards so there is an objective means of verifying that meat and poultry establishments are achieving acceptable levels of performance—and in this case, it means producing meat and poultry with lower levels of pathogenic microorganisms.”

—Michael R. Taylor

Q. If a plant has HACCP in place, isn't that enough—why are microbial standards needed as well?

HACCP systems are not enough—we must also have pathogen reduction standards that the HACCP systems are designed to meet. Otherwise, each plant could set its own standard, and products coming from one plant would be less safe than products coming from another. HACCP-based process control must be combined with food safety performance criteria and standards so there is an objective means of verifying that meat and poultry establishments are achieving acceptable levels of performance—and in this case, it means producing meat and poultry with lower levels of pathogenic microorganisms.

Q. What about the future—do you intend to set standards for pathogens other than *Salmonella*?

A. This is just the first step in what we expect to be a broader reliance in the future on pathogen-specific performance standards for raw products. As we collect more data, we may be able to set criteria or standards for additional pathogens as well.

Q. How can you set a standard if you don't know how much will make someone sick?

A. We have good baseline data telling us the incidence of *Salmonella* contamination that is currently found in most meat and poultry products. We believe all plants should be required to at least achieve the current national average of *Salmonella* contamination based on our studies. It's important to remember that these regulatory standards for *Salmonella* are not permanent—we expect to adjust them as time goes on and we get better data on rates of contamination and their association with foodborne illness.

Dr. J. Glenn Morris —

Public Health Impact of the New Rules



Q. From a public health standpoint, how will the new rule benefit the public?

- A. First you have to understand that we have a problem with foodborne disease in this country. From a health standpoint, there's a general consensus that the problem is microbial—it's bacteria. We can't see, feel or taste them, but somehow, we have to control the bacteria that make people sick. Now, we can begin to control them with the science-based system of prevention known as HACCP. We can make sure the system is working through our microbial testing.

Q. How do we think the new inspection system will affect the prevalence of *E. coli* O157:H7?

- A. We currently have a testing program that monitors for *E. coli* O157:H7 in ground beef. This program will continue. But this type of bacteria can be hard to find, and you can't test every piece of meat. So we need to make sure that our systems are working—that we are preventing the bacteria from entering the food chain in the first place. Beef slaughter and ground beef plants will be required to validate the effectiveness of their HACCP plans in preventing contamination with *E. coli* O157:H7.

Plants will be required to test for generic *E. coli* to assure that the procedures they have put in place control fecal contamination. Generic *E. coli* tells you if fecal contamination is present. We know that *E. coli* O157:H7 to a large degree follows fecal contamination. If we reduce one, we should be able to reduce the other.

Q. Exactly how will testing for *Salmonella* result in a decrease in foodborne illness?

- A. All food has some bacteria on it, possibly including dangerous bacteria, like *Salmonella*. If the number of bacteria is too high, it can make you sick. In addition, if we can reduce levels of *Salmonella*, we should be able to reduce levels of other pathogenic, or dangerous, bacteria.

Under the new rules, we'll be telling plants they have a legal responsibility to target and control *Salmonella*. Our testing will ensure that plants meet this responsibility.

But it's important for people to remember this: testing in itself doesn't make food safe. You can't test every inch of a piece of meat. Testing does two things. It helps plants see if their HACCP system is working effectively, and it enables us to set and enforce standards plants have to meet in terms of reducing and controlling dangerous bacteria.

“From a health standpoint, the problem is microbial—it's bacteria. We can't see, feel, or taste them—but somehow, we have to control the bacteria that make people sick. We do that through a science-based system of prevention known as HACCP. We can make sure the system is working through our microbial testing.”

—J. Glenn Morris, M.D.

Q. Why do we believe this new plan will work?

- A.** We actually did a kind of “pilot project” on this plan back in the late 1980’s. We were having trouble with a dangerous bacteria called *Listeria*, which was turning up in deli meats and other processed products.

USDA and the Food and Drug Administration set up a system with plants to improve their procedures and established a “zero” tolerance for the bacterium in finished ready-to-eat products. And the system worked. Since 1989, the incidence of illness from the bacteria declined 44 percent.

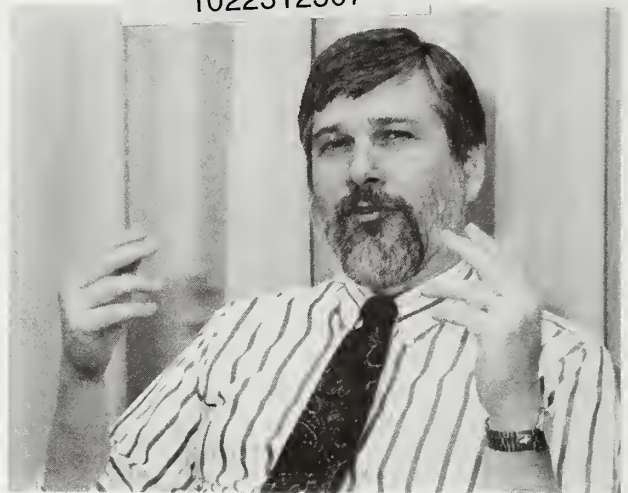
Listeria is a great success story. It’s a very dramatic indication of how a regulatory change can have a significant impact on rates of human disease. I would hope to see a similar type of decrease for other pathogens from our current initiative.

Q. How will we know the health impact of reducing dangerous bacteria on meat and poultry in plants?

- A.** The only way we’re really going to know is by seeing if there is a decline in the number of people becoming sick. And we have a system in place now to monitor that. Last July we started a new monitoring program for foodborne disease with the Centers for Disease Control and Prevention and the Food and Drug Administration.

We have sites in five states that are gathering and analyzing information on foodborne illness, the number of outbreaks and the causes. We’ll be able to project what’s happening nationwide from those five sites. And that will be the ultimate report card.

That’s why looking back at what happened with the *Listeria* problem is so important. That initiative worked. All right, this is a much larger scale, but we’re shooting for the same types of results. And we think those are reasonable expectations.



Q. If plants improve the safety of meat and poultry, do consumers still need to be concerned about how they handle food?

- A.** Yes. Everybody in the food chain—from the farm to the dinner table—needs to be concerned about food safety. It’s vitally important for consumers to handle food safely. We need to cook foods thoroughly, clean anything that touches raw meat or poultry—like cutting boards, knives, counters—and refrigerate leftovers right away.

At the same time, if plants can reduce levels of dangerous bacteria on food, it’s going to help reduce disease. We are working with industry to make sure that consumers are getting the safest possible product. If we can help industry deliver a safer product, and continue to educate consumers about safe food handling, we can do a lot to help people not get sick—and die—from foodborne disease.

Glossy B&W photos are available from the Information and Legislative Affairs office of the USDA’s Food Safety and Inspection Service (202) 720-7943; fax (202) 720-1843.